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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,407	06/06/2000	Richard D. Blackmore	240-P-028	9445

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EXAMINER

MAKI, STEVEN D

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 12/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/588,407

Applicant(s)

BLACKMORE ET AL.

Examin r

Steven D. Maki

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-- The MAILING DATE of this communication app ars on the cover sh et with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 12-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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- 1) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 2) Claims 3 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 is indefinite because it describes selecting the nonmetallic, electrically conductive fibers from "carbon, nylon, and polyester" and (2) nylon fibers and polyester fibers are not electrically conductive.

In claim 17, it is not clear what additional limitation of "the apparatus" (in contrast to a "system comprising an apparatus and product worked upon") is being claimed.

- 3) Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 17 merely describes the product worked on instead of an additional limitation. Applicant argues that claim 17 provides a further limitation of its parent claim 12 since claim 17 recites a pre-preg which is not recited in claim 12. Applicant's analysis is incomplete and therefore not persuasive. The pre-preg in claim 17 is given no weight because claim 12 is directed to an apparatus and the pre-preg is not part of the apparatus (it is the product worked upon by the apparatus); applicant has provided no argument to the contrary.

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4) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Davis et al

6) **Claims 1, 3-6 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Davis et al (US 5,259,901).**

Davis et al discloses an inflatable bladder comprising a helical graphite fiber in a cured silicone elastomer matrix.

Davis et al discloses an inflatable mandrel comprising a matrix material such as silicone elastomer and reinforcement fiber wherein the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The reinforcing fiber may be a graphite fiber. See col. 7 lines 47-50.

In claim 1, the “nonmetallic, electrically conductive fibers” reads on the graphite fibers of Davis et al.

Claim 1 contains a product by process limitation. The product by process limitation is “said matrix being cured to a stable elastomeric state by electric resistive

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heating of said ... fibers". This product by process language fails to require structure not shown by Davis et al. See MPEP 2113. In any event: It would have been obvious to provide the inflatable mandrel of Davis et al so as to satisfy "'said matrix being cured to a stable elastomeric state by electric resistive heating of said ... fibers" (emphasis added) since Davis et al teaches curing the matrix material (e.g. the silicone elastomer) using an autoclave and using fibers such as graphite fibers.

As to claim 1, the description of the inflatable device being an "inflatable heating device" (emphasis added) in the preamble relates to the intended use and fails to require a power source connected to the nonmetallic conductive fiber. The inflatable device claimed in claim 1 therefore fails to require "means such as power source connected to the carbon fiber" not shown by Davis et al. In other words, claim 1 reads on a mandrel which is merely inflatable. Claim 1 fails to require either directly or indirectly heating of the bladder.

In claims 3 and 21, "carbon fiber" reads on --graphite fiber--. In any event: As to claim 3, it would have been obvious to use a carbon reinforcing fiber as the fiber in the inflatable mandrel (bladder) of Davis et al since (a) Davis suggests using a reinforcing fiber such as a graphite fiber in the inflatable mandrel (bladder) and (b) it is taken as well known / conventional per se in the composite art that carbon fibers and graphite fibers are alternative reinforcing fibers for composite material.

As to claims 4-6 and 21, note Davis et al's teachings regarding the reinforcing fiber. In any event: The limitation of the fibers being at ± 45 degrees (claim 4) / the 50-90% coverage (claim 5) would have been obvious in view of Davis et al's teaching that

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the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape.

7) **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (US 5,259,901) as applied above and further in view of Europe '761 (EP 432761), Guenthner et al (US 5,216,085) or Rianda (US 4,792,374).**

As to claim 2, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder of Davis et al in view of Europe '761, Guenthner et al or Rianda – Europe '761 suggesting use of fluorosilicone for a bladder, Guenthner et al suggesting the use of fluorocarbon for a bladder and Rianda suggesting the use of fluorosilicone for a bladder.

8) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Barton et al

9) **Claims 1-6, 12-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and Japan '334 (JP 2-150334) and on of "Wood et al (US 5,706,861), Davis et al (US**

5259901), Hollingsworth (US 5266137) and Guenther et al (US 5216085)” and optionally further in view of at least one of PCT (WO 93/06410), Rankin (US 1362351) and Baker (US 4,191,383).

Barton discloses *heating* an **inflatable bladder** during repairing a pipe. Japan '323 and Japan '334, which are in the same field of endeavor as Barton, suggest using **heating elements** in the **bladder** of Barton to obtain the *heating* of the bladder desired by Barton. The use of cured thermoset resin for the bladder is suggested by and is nothing more than the use of the usual material used for bladders as evidenced by Wood et al, Davis et al, Hollingsworth and Guenther et al. The combination of the applied prior art is described in more detail below:

Barton discloses an apparatus for repairing a conduit comprising a bladder 52 made of “resilient, flexible material such as rubber or various types of plastic which may be conveniently inflated and deflated (col. 4 lines 9-12); a first plug 54; a second plug 56; wherein the plugs 54 and 56 are connected in any air tight manner to opposing ends of the bladder 52. An air inlet 71 is formed through plug 54 and communicates with a pump which inflates and deflates the bladder. Barton teaches applying hardening material such as epoxy resin to a sleeve 72, placing the sleeve on the bladder, interconnecting (removable attaching) the sleeve to the plug 54, introducing the apparatus into the conduit, using the pump to inflate the bladder and press the sleeve against the inner surface of the conduit, and accelerating the curing of the sleeve by pumping hot air into the bladder.

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Barton does not specifically recite using elastomeric composite, which includes a heating element disposed in a thermoset resin matrix, as the bladder.

As to inflatable device containing heating element, it would have been obvious to one of ordinary skill in the art to use a bladder, which includes heating element disposed in a matrix material, as the bladder of Barton since (a) Barton teaches using the **bladder to heat** the repair material comprising the sleeve and the thermosetting resin, (b) Japan '323 suggests applying electric current to *conductive material* in a **bladder (heating tube) to heat** a lining material which is impregnated with thermosetting resin, and (c) Japan '334 suggests applying current to a *cloth* of **bladder (expandable body 4)** which is illustrated as having the cloth 7 therein **to heat** repairing material comprising a sleeve and thermosetting adhesive. Hence, each of Barton, Japan '323 and Japan '334 are directed to lining / repairing a conduit with lining material which comprising thermosetting material. Barton teaches using a bladder to apply pressure. Barton teaches heating the bladder (albeit with hot air instead of with heating element in the bladder) to heat and cure the resin. Japan '323 and Japan '334, which are in the same field of endeavor as Barton, motivate one of ordinary skill in the art to accomplish the step of heating the bladder by incorporating conductive heating elements in the bladder. The motivation is expressed by Japan '323 as an increase in work efficiency (uniform cure) and reduction of cost.

As to the matrix being a thermoset resin matrix, it would have been obvious to one of ordinary skill in the art to use thermoset resin matrix such as silicone for the bladder since (a) Barton teaches composing the bladder of a "resilient, flexible material

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such as rubber or various types of plastic [resin] which may be conveniently inflated and deflated” and (b) thermoset resin matrix such as silicone matrix is well known / conventional materials per se for an inflatable bladder as evidenced by one of Wood et al (silicone at col. 4), Davis et al (col. 6 lines 43-53) and Hollingsworth (silicone at col. 4), and Guenther et al (fluorocarbon at abstract, col. 2).

As to the heating element being nonmetallic electrically conducting fibers (claim 1) / non-ferrous heating element (claim 12), it would have been obvious to a non-ferrous heating element such as carbon fiber in view of (a) Japan ‘334’s teaching to use a conductive fabric as the heating element and optionally (b) since PCT, directed to the repair art as is Barton, suggests using graphite fiber as a heating element – it being taken as well known / conventional per that carbon fibers and graphite fibers are alternative conductive fibers for use as heating elements.

As to vacuum port (claim 1), it would have been an obvious alternative to provide an air port and a vacuum port instead of a single port for alternately supplying air and a vacuum to the bladder to inflate and deflate the bladder since it is taken as well known / conventional in the lining art to provide a port for inflating a bladder and a separate port for deflating the bladder.

As to product by process language (claim 1), the product by process limitation of “said matrix being cured to a stable elastomeric state by electric resistive heating of said ... fibers” fails to require structure (composition / state of cure) not suggested by one of Wood et al, Davis et al, Hollingsworth and Guenther et al. In other words, each of these secondary references suggest cured material for a bladder.

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As to claim 2, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder in view of Guenthner et al's suggestion to use fluorocarbon for a bladder.

As to claim 3, note PCT's suggestion to use carbon fibers as electrically heating elements.

As to claims 4-6, it would have been obvious to incorporate the fiber in the bladder of Barton using winding since Davis et al suggestion that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape. The use of two types of fibers (glass fibers and fibers) would have been obvious since it is taken as well known / conventional per se in the lining art to include glass fibers and conductive wires in a bladder for lining a duct.

As to claim 13, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder in view of Guenthner et al's suggestion to use fluorocarbon for a bladder.

As to claims 14-16, it would have been obvious to a heating element comprising braided fibers as claimed in view of (a) Rankin's teaching to use braided fibers as a heating element and/or (b) Baker et al's suggestion to use braided material in a bladder which like that of Barton is inflatable. The use of two types of fibers would have been

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obvious since it is taken as well known / conventional per se in the lining art to include glass fibers and conductive wires in a bladder for lining a duct.

As to claim 17, the pre preg is not part of the claimed apparatus.

As to claims 18-19, it would have been obvious to incorporate the fiber in the bladder of Barton using winding since Davis et al suggestion that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The use of two types of fibers (glass fibers and fibers) would have been obvious since it is taken as well known / conventional per se in the lining art to include glass fibers and conductive wires in a bladder for lining a duct.

10) **Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (US 4,995,761) in view of Japan '323 (JP 2-158323) and Japan '334 (JP 2-150334) and one of "Wood et al (US 5,706,861), Davis et al (US 5259901), Hollingsworth (US 5266137) and Guenther et al (US 5216085)" and optionally further in view of at least one of PCT (WO 93/06410), Rankin (US 1362351) and Baker (US 4,191,383) as applied above and further in view of Lippiatt (US 5,199,463).**

As to *pre preg* (claims 17 and 20), it would have been obvious to removable attach a pre preg comprising fibers and thermosetting resin since (a) Barton suggests removable attaching a sleeve having thermosetting resin applied thereto and (b) Lippiatt, also directed to repairing conduits, suggests removably attaching lining material in the form of a pre-preg (fibrous material impregnated with heat curable resin) to a bladder using loose ties.

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Remarks

11) Applicant's arguments with respect to claims 1-6 and 12-21 have been considered but are moot in view of the new ground(s) of rejection.

This action is non-final since the use of Rankin (US 1362351) was not necessitated by amendment.

Applicant's election with traverse of Group I in Paper No. 7 is acknowledged. The traversal is on the ground(s) that in view of the electrical resistive heat cure limitation, which is consistent with the process claims, the restriction requirement is inappropriate. This is not found persuasive because the product (the inflatable heating device) as claimed can be made by a materially different process such (1) a process including use of infrared heating, use of inductive heating or use of heated press or (2) a process including winding matrix covered fibers or (3) a process of winding fibers and then impregnating the fibers.

Applicant's arguments filed 9-19-02 have been fully considered but they are not persuasive.

Applicant's arguments regarding Japan '323 and Japan '334 are not persuasive since Japan '323 and Japan '334 provide ample suggestion to use heating elements in the bladder of Barton.

Applicant's argument that a significant advantage is achieved by use of the electrically conductive heating element both to cure the inflatable composite body itself and to subsequently cure the pre-preg repair piece is not commensurate in scope with the claims and is therefore not persuasive since none of the claims require use of the

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electrically conductive heating element both to cure the inflatable composite body itself and to subsequently cure the pre-preg repair piece.

The remaining references are cited of interest.


12) No claim is allowed.

13) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is 703-308-2068. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Steven D. Maki
December 2, 2002


STEVEN D. MAKI 12-2-02
PRIMARY EXAMINER
~~GROUP 1300~~
AU 1733